

CHILDREN AND THE KINETIC CHAIN

Establishing a solid foundation for optimal development

BY KEVIN M. WONG, DC

TIME TO READ: 6-8 MIN.

THE TAKEAWAY

Early intervention and an understanding of foot development and three-arch support corrections can go a long way in the developing spinal health of young patients.

IN CLINICAL PRACTICES WE HAVE OPPORTUNITIES to treat patients of different ages, starting with children. By learning and providing the examinations, adjustment techniques and treatment options young patients require, we can be more successful partners in proactive health during these crucial formative years.

Children have different needs than older individuals and knowing those distinctions helps you create more effective care plans that lay the foundation for healthy growth and development.

Lower kinetic chain stability determines how efficiently and effectively the spine and ultimately the upper kinetic chain work together.

Kinetic chain function

As chiropractors, we have an appreciation for the human body's movement. Observing and understanding joint biomechanics and how body parts relate to each other helps formulate our understanding of the patient's diagnoses and treatment plan.

The kinetic chain represents how parts of the body act together as a system of chain links, where energy generated by one link (or part of the body) is transferred to the next. Understanding proper kinetic chain function and integrating it in daily protocol is pivotal to the long-term success of your care. This is especially true when you are treating young patients with developing bodies.

The kinetic chain consists of interrelated groups of body segments, connecting joints and muscles working together to help facilitate healthy movement and weight-bearing.

Lower kinetic chain stability determines how efficiently and effectively the spine and ultimately the upper kinetic chain work together. If part of the chain is faulty, it can negatively affect the other parts. This can be observed with faulty foot/ankle stability involving the three plantar foot arches that form not only the foundation of the body but the first link in the lower kinetic chain.



The kinetic chain. If any part of it is faulty, it impacts the other parts.

Targeting the source of kinetic stress

Let's start at the beginning and take a closer look at kinetic chain function in children and young adults. You will see when early kinetic chain stress occurs and how it can impact the success of your treatments:

The arches and plantar vault — Children aren't born with foot arches. A baby's foot is padded with fat and is highly flexible. Most children begin to walk anywhere between 8-18 months of age, during which time the muscles along the soles of their feet strengthen and the ligaments stiffen and tighten. In general, the three arches begin to develop when the child is around age 4. Most have finished forming by the time they are 6-7 years old. By that time, their level of arch support has been established.

AGE 4
WHEN THE THREE ARCHES
BEGIN DEVELOPING IN
CHILDREN



The stages of development for the feet, and arches — what to look for:

- **Birth to 2 years:** bowing knees and toeing in is common
- **Ages 3-5:** knock knees and toeing in is common
- **Ages 6-7:** knees and feet (arches) should resemble adult positioning

A 2006 study found that 44% of the preschool-aged children observed had a flexible flat foot. The children included in the study were between 3-6 years old. The younger children had a higher percentage of flatfoot than the older children, and boys were more likely to have flatter arches than girls.*

By the time our young patients are 7 years old, we can already observe the beginning of arch collapse. Excessively pronating feet in turn negatively affect the other points of the kinetic chain as stress is transferred from the feet to the connected joints and soft tissues. Genetics is an important factor in a child developing flat feet, which you may notice if you also treat their parents.

As their health care provider, you can guide good habits and help create a stable foundation for children as they advance through life.

So how do we help our young patients?

We want to help patients of all ages establish healthy postural patterns. The feet are a major influencer of posture and we realize how important preventative care is for younger people.

As their health care provider, you can guide good habits and help create a stable foundation for children as they advance through life. Positive or negative effects of the feet and arches on the kinetic chain can affect them later on. By treating foot dysfunction through early intervention, you can help establish healthy postural patterns that enhance proper kinetic chain function for optimal mobility and better overall health.

Physiotherapy modalities

Appropriate usage of various modalities can be effective with any symptoms. Children often need shorter treatment times and lower intensities/frequencies due to the smaller areas or structures we are working on.

We observe there are contraindications of cold laser and ultrasound over growth plates.

AGE 7
WHEN YOU CAN ALREADY
OBSERVE THE BEGINNING
OF ARCH COLLAPSE



Chiropractic adjustments for children

Feet, ankles and knees can be treated using an adjusting instrument in toddlers. This will progress to manual adjustments when you feel the child is ready or they are necessary to establish better alignment. Younger children do not need much force and often light impulses or thrusts with our hands will correct the bones.

Exercises for strength-building and rehabilitation

Some believe that exercises are not necessary and children will outgrow their flexible flatfoot. If a child's arches are moderately to severely collapsed, I suggest exercises. Remember that the arches are primarily supported by the plantar fascia, bone-to-bone ligaments, and the spring ligament, which can be strengthened through exercise.

The intrinsic foot muscles provide secondary support for the foot. The interesting thing about exercises for younger patients

is that exercises may help keep their arches supported if done consistently and properly.

Here are some of the more popular ones:

- Arch lifts (foot doming)
- Marble pickups or towel scrunch exercises
- Heel raises
- Heel walking/toe walking

Foot stabilization with custom three-arch orthotics

Normally, custom orthotic intervention is considered between the ages of 6-7. When the child is 5 years old, I try to get a baseline of what might be coming in the near future. Flexible three-arch custom orthotics will fully support the plantar vault, the lower kinetic chain, joints and soft tissues against over-pronating and over-supinating feet.


Children are more active now than ever. Foot/arch support and subsequent kinetic chain stabilizations give our young patients the support their bodies need for the sports and physical activities they begin pursuing at very young ages. Many play multiple sports with almost no off-season.

By properly stabilizing and balancing their bodies, you can help young athletes perform better and help reduce their risk of injuries during sports and active play.

The importance of proper footwear

When toddlers are learning to walk, they should be in bare feet or a soft-soled shoe as much as possible so they can feel what they touch with their feet and develop muscle strength. When toddlers have been confidently walking on their own for a period of time, they can progress to a firmer-soled shoe.

A toe box wide enough to have a good "ball fit," along with a stable instep, supportive heel counter and reasonably durable construction are crucial as children develop gait patterns.

Through chiropractic treatment, appropriate secondary supportive foot exercises and foot stabilization, kinetic chain function in children can be improved. Stabilization is especially important to help them minimize faulty foot arch biomechanics that can harm their bodies and reduce the effectiveness of chiropractic care. 

KEVIN M. WONG, DC, is a graduate of the University of California-Davis and a 1996 graduate of Palmer College of Chiropractic West. He has been in practice for over 26 years and is the owner of Orinda Chiropractic & Laser Center in Orinda, Calif. As a member of Foot Levelers' Speakers Bureau since 2004, he travels the country speaking on extremity and spinal adjusting.

References can be found online at chiroeco.com